UNIVERSITY OF CALIFORNIA
LAWRENCE BERKELEY NATIONAL LABORATORY
BERKELEY LAB
FACILITIES DIVISION

BUILDING 77
UNDULATOR
MEASUREMENT FACILITY
FIRE ALARM

1 Cyclotron Road,
Berkeley, California 94720

GENERAL ELECTRICAL NOTES

1. ALL WIRING AND INSTALLATION MUST CONFORM WITH PROJECT SPECIFICATIONS, APPLICABLE CODE SUMMARIES AND REQUIREMENTS ADOPTED BY LBNL.
2. SMOKE DETECTORS SHOULD NOT BE LOCATED IN A DIRECT AIRFLOW NOR CLOSER THAN 3 FEET (1 m) FROM AN AIR SUPPLY DIFFUSER OR RETURN AIR OPENING. PER NFPA 72 (CHAPTER A-17.7.4.1) 2010 EDITION.
3. WHEN INSTALLING INITIATING AND AUDIBLE DEVICES, POLARITY MUST BE OBSERVED.
4. NOT USED.
5. ALL 24 VDC WIRE TO BE INSTALLED IN DEDICATED CONDUIT SEPARATE FROM 120 VAC WIRING, IN ACCORDANCE WITH CURRENT NATIONAL AND STATE ELECTRICAL CODES.
6. CONDUIT SIZING TO BE DETERMINED BY ELECTRICAL CONTRACTOR AND SHALL CONFORM TO CONDUIT FILL CAPACITIES AS PER REQUIREMENTS OF CURRENT EDITIONS OF NATIONAL AND STATE ELECTRICAL CODES.
7. DO NOT APPLY 120 VAC POWER TO CONTROL PANEL UNTIL A SIEMENS FIRE SAFETY SERVICE TECHNICIAN HAS INSPECTED ALL SYSTEM WIRING CONNECTIONS AND HAS APPROVED THE SYSTEM TO BE TURNED ON.
8. ALL PLUG-IN TYPE DETECTORS REQUIRE A 4" OCTAGONAL, 1-1/2" OR DEEPER MOUNTING BOX. REFER TO DETAIL DRAWINGS FOR DEVICE WIRING AND MOUNTING CONDITIONS.
9. 120 VAC INPUT CONNECTIONS TO THE FIRE ALARM CONTROL PANEL SHALL BE ON DEDICATED BRANCH CIRCUIT(S). THE CIRCUIT(S) AND CONNECTIONS SHALL BE MECHANICALLY PROTECTED. CIRCUIT DISCONNECTION SHALL HAVE A RED MARKING. SHALL BE ACCESSIBLE ONLY TO AUTHORIZED PERSONNEL AND SHALL BE IDENTIFIED AS FIRE ALARM CIRCUIT CONTROL. THE LOCATION OF THE CIRCUIT DISCONNECTING BREAKER SHALL BE PERMANENTLY IDENTIFIED AT THE FIRE ALARM CONTROL UNIT.
10. INSTALLATION MATERIALS SUCH AS CONDUITS, FITTINGS, JUNCTION BOXES, TERMINAL CABINETS, PULL BOXES, HANGERS, ETC. ARE SUPPLIED AND INSTALLED BY ELECTRICAL CONTRACTOR. ALL WIRING IS TO BE FROM DEVICE TERMINAL TO DEVICE TERMINAL SPLICES AND WIRE NUTS ARE NOT ACCEPTABLE.
11. ANY DEVIATION FROM THE DESIGN AND LOCATION OF EQUIPMENT SHOWN MUST FIRST HAVE A WRITTEN APPROVAL FROM SIEMENS FIRE SAFETY AND THE LBNL FIRE MARSHAL'S OFFICE. ANY DEVIATION FROM DESIGN MUST ALSO BE INDICATED ON SIEMENS FIRE SAFETY SHOP DRAWINGS (BLUEPRINTS) AND RETURNED TO SIEMENS FIRE SAFETY AT TIME OF JOB COMPLETION.
12. THE DRAWINGS REPRESENT A SIEMENS FIRE SAFETY ENGINEERED FIRE ALARM SYSTEM PER CONTRACTUAL DESIGN DRAWINGS AND SPECIFICATIONS.
a) ELECTRICAL CONTRACTOR SHALL NOT DEVIATE BY NOT MORE THAN 5% FROM THE FINAL APPROVED SHOP DRAWINGS.
b) WIRE RUNS HAVE BEEN ENGINEERED TO COMPLY WITH SPECIFIC VOLTAGE DROP REQUIREMENTS. ANY DEVIATION FROM SHOWN WIRE RUNS WHICH RESULTS IN NON-COMPLIANCE WITH VOLTAGE DROP REQUIREMENTS SHALL BE THE SOLE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
c) THESE SUBMITTED SHOP DRAWINGS ARE COMPLETE. SIEMENS FIRE SAFETY SHALL NOT BEAR ANY ADDITIONAL COSTS OF RE-ENGINEERING RECORD DRAWINGS (AS-BUILTS).
13. ALL NEW SMOKE DETECTORS SHALL BE PROTECTED FROM DUST AND DEBRIS DURING CONSTRUCTION. SMOKE-SENSING DETECTORS SHALL NOT BE INSTALLED UNTIL AFTER THE CONSTRUCTION CLEANUP OF ALL TRADES IS COMPLETE AND FINAL. PER NFPA 72 (17.7.1.1I) 2010 EDITION. Exception: WHERE REQUIRED BY THE AUTHORITY HAVING JURISDICTION FOR PROTECTION DURING CONSTRUCTION. DETECTORS THAT HAVE BEEN INSTALLED DURING CONSTRUCTION AND FOUND TO HAVE A SENSITIVITY OUTSIDE THE LISTED AND MARKED SENSITIVITY RANGE SHALL BE CLEANED OR REPLACED AT AN ADDITIONAL COST TO ELECTRICAL CONTRACTOR.
14. IF REQUIRED BY THE OWNER OR CONTRACT, LABELING OF FIELD DEVICES SHALL BE SUPPLIED BY ELECTRICAL CONTRACTOR.
15. ACCEPTANCE TESTING SHALL COMPLY WITH NFPA 72: 14.4.1.2.1.4 AND SHALL INCORPORATE 100% OF ALL DEVICES AFFECTED BY THIS MODIFICATION AS WELL AS 10% OF INITIATING DEVICES NOT DIRECTLY AFFECTED UP TO A MAXIMUM OF 50 DEVICES.
16. GROUND WIRE SHALL RUN THROUGHOUT ALL FIRE ALARM CONDUIT SYSTEM.
17. DO NOT INSTALL ADDRESSABLE DEVICES PRIOR TO PROGRAMMING. SEE NOTE 13.

FIRE ALARM EQUIPMENT LIST

CATEGORY	ITEM NO.	SYMBOL	QTY	MODEL NUMBER	DESCRIPTION	MANUFACTURER	DATA SHEET NUMBER	CALIFORNIA STATE FIRE MARSHAL LISTING NUMBER
(E) SYSTEM 3-PANEL FAP-01-77	1		1	AA-30U	CLASS A ALARM EXTENDER (1) SPACE	SIEMENS	3129	7165-0067:0035
	2							
	3							
	4	FAP						
	5							
	6							
	7							
	8							
(E) SYSTEM 3-PANEL FAP-02-77	9		1	ZU-350S	DUAL ZONE WITH SWITCHES (1) SPACE	SIEMENS	3107	7165-0067:0035
	10		1	SM-30	SWITCH MODULE	SIEMENS	3162	7165-0067:0035
	11							
	12	FAP						
	13							
	14							
	15							
	16							
FIELD DEVICES	17		1	ST-MC-RETRO-R	MULTI CANDELA STROBE, 15cd (Red) Wall Mtd.	SIEMENS	2573	7125-0067:0252
	18				MULTI CANDELA STROBE, 30cd (Red) Wall Mtd.	SIEMENS	2573	7125-0067:0252
	19	FSRm			MULTI CANDELA STROBE, 75cd (Red) Wall Mtd.	SIEMENS	2573	7125-0067:0252
	20				MULTI CANDELA STROBE, 110cd (Red) Wall Mtd.	SIEMENS	2573	7125-0067:0252
	21		1	MBDC-6	6" MOTOR BELL	SIEMENS	2570	7135-0067:0137
	22		2	PE-11	CONVENTIONAL PHOTOELECTRIC SMOKE DETECTOR	SIEMENS	6173	7272-0067:0186
	23		2	DB-11	DETECTOR BASE FOR PE-11 DETECTOR	SIEMENS	6173	7300-0067:0134
	24		1	PE-11	PHOTOELECTRIC SMOKE DETECTOR	SIEMENS	6173	7272-0067:0186
	25	DDH	1	AD2-P	DUCT DETECTOR HOUSING	SIEMENS	6185	3240-0067:0245
	26		1	ST-50	DUCT DETECTOR SAMPLING TUBE	SIEMENS	6185	---
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MISCELLANEOUS SYMBOLS	75	(E)	---	---	EXISTING / EXISTING DEVICE TO REMAIN	---		
	76	(N)	---	---	NEW / NEW DEVICE	---		
	77							
	78							
	79							

DRAWING INDEX

CODE SUMMARY

2010 California Administrative Code (CAC)
Part 1, Title 24, California Code of Regulations (CCR)

2010 California Building Code (CBC)
Part 2, Title 24, CCR (Based on the 2009 International Building Code (IBC))

2010 California Electrical Code (CEC)
Part 3, Title 24, CCR (Based on the 2008 National Electrical Code (NEC))

2010 California Mechanical Code (CMC)
Part 4, Title 24, CCR (Based on the 2009 Uniform Mechanical Code (UMC))

2010 California Fire Code (CFC)
Part 9, Title 24, CCR (Based on the 2009 International Fire Code (IFC))

2010 NFPA 72, National Fire Alarm Code
And All Amendments and Additions to the Above

ADA – AMERICANS with DISABILITIES ACT

SCOPE OF WORK

1. ADDITION OF (1) BELL/STROBE AND (2) SMOKE DETECTORS TO LBNL B77 UNDULATOR MEASUREMENT FACILITY PROJECT.
2. UPON UNDULATOR SMOKE DETECTORS AND AHU DUCT SMOKE DETECTOR ALARM, FIRE ALARM RELAY CIRCUIT WILL SEND A SIGNAL TO DIGITAL CONTROLS TO SHUTDOWN 77-AHU-037.
2. NEW DEVICES SHALL BE TIED IN TO EXISTING FIRE ALARM SYSTEM.
3. PROVISION OF EQUIPMENT OR DEVICES AS ENUMERATED IN THE FIRE ALARM EQUIPMENT LIST.
4. INSPECTION & TESTING FOR A COMPLETE AND OPERATIONAL FIRE ALARM SYSTEM.

SYSTEM-3 GENERAL WIRING GUIDELINES

1. ALL WIRING MUST CONFORM WITH SPECIFICATIONS, CALIFORNIA ELECTRICAL CODE (CURRENT EDITION), DRAWINGS AND LOCAL CODES.
2. ANY DEVIATION FROM THE DESIGN AND LOCATION OF EQUIPMENT SHOWN MUST FIRST HAVE THE WRITTEN APPROVAL FROM SIEMENS BUILDING TECHNOLOGIES, INC. ANY DEVIATION FROM DESIGN MUST ALSO BE INDICATED ON SIEMENS BUILDING TECHNOLOGIES, INC. BLUEPRINTS AND RETURNED TO SIEMENS BUILDING TECHNOLOGIES, INC. AT TIME OF JOB COMPLETION.
3. ALL INSTALLATION MATERIAL SUCH AS CONDUIT, FITTINGS, BOXES AND HANGERS, ETC. ARE NOT SUPPLIED BY SIEMENS BUILDING TECHNOLOGIES INC.
4. INITIATING DEVICE AND AUDIBLE ALARM DEVICE CIRCUIT POLARITY MUST BE OBSERVED.
5. ALL INITIATING CIRCUITS AND AUDIBLE ALARM CIRCUIT WIRES MUST BE SUPERVISED. THEREFORE, NO PARALLEL BRANCHING OF WIRING IS PERMISSIBLE.
6. WIRE RUNS ARE SHOWN DIAGRAMMATICALLY. EXACT LOCATION OF ALL WIRE RUNS TO BE DETERMINED IN THE FIELD.
7. ALL PLUG-IN TYPE DETECTORS REQUIRE A 4" OCTAGONAL, 1 1/2" OR DEEPER MOUNTING BOX.
8. PHOTOELECTRIC DETECTORS SHALL NOT BE LOCATED IN DIRECT AIR STREAM FROM SUPPLY AIR OUTLETS.
9. DO NOT APPLY A.C. POWER TO CONTROL PANEL UNTIL A SIEMENS BUILDING TECHNOLOGIES SERVICE TECHNICIAN HAS INSPECTED ALL WIRING, CONNECTIONS, ETC. AND HAS APPROVED THE SYSTEM TO BE TURNED ON.

CLASS A WIRING

CLASS A WIRING PER NFPA 72 2010 EDITION / CHAPTER 23.4.2.2*

ALL STYLES OF CLASS A CIRCUITS USING PHYSICAL CONDUCTORS (FOR EXAMPLE, METALLIC, OPTICAL FIBER) SHALL BE INSTALLED SUCH THAT THE OUT GOING AND RETURN CONDUCTORS , EXITING FROM AND RETURNING TO THE CONTROL UNIT, RESPECTIVELY, ARE ROUTED SEPARATELY. THE OUTGOING AND RETURN (REDUNDANT) CIRCUIT CONDUCTORS SHALL NOT BE RUN IN THE SAME CABLE ASSEMBLY (THAT IS, MULTICONDUCTOR CABLE), ENCLOSURE, OR RACEWAY.

EXCEPTION: THE OUTGOING AND RETURN (REDUNDANT) CIRCUIT CONDUCTORS SHALL BE PERMITTED TO BE RUN IN THE SAME CABLE, ASSEMBLY, ENCLOSURE, OR RACEWAY UNDER ANY OF THE FOLLOWING CONDITIONS:

(1) FOR A DISTANCE NOT TO EXCEED 10 FT (3 M) WHERE THE OUTGOING AND RETURN CONDUCTORS ENTER OR EXIT THE INITIATING DEVICE, NOTIFICATION APPLIANCE, CONTROL UNIT ENCLOSURES.

(2) SINGLE CONDUIT/RACEWAY DROPS TO INDIVIDUAL DEVICES OR APPLIANCES.

(3) SINGLE CONDUIT/RACEWAY DROPS TO MULTIPLE DEVICES OR APPLIANCES INSTALLED WITHIN A SINGLE ROOM NOT EXCEEDING 1000 FT^2 (92.9 M^2) IN AREA SHALL BE PERMITTED.

CLASS A WIRING PER NFPA 72 2010 EDITION / ANNEX A.23.4.2.2
A GOAL OF 23.4.2.2 IS TO PROVIDE ADEQUATE SEPARATION BETWEEN THE OUTGOING AND RETURN CABLES. THIS SEPARATION IS REQUIRED TO HELP ENSURE PROTECTION OF THE CABLES FROM PHYSICAL DAMAGE. THE RECOMMENDED MINIMUM SEPARATION TO PREVENT PHYSICAL DAMAGE IS 1 FT (0.305 m) WHERE THE CABLE IS INSTALLED VERTICALLY AND 4 FT (1.22 m) WHERE THE CABLE INSTALLED HORIZONTALLY.

AS-BUILT
–
RECORD SET
02/04/2013

REVISION NUMBER	DRAWN BY	CHECKED BY	APPR'D BY	DATE	REMARKS
	JPM	KW	–	02/04/13	AS-BUILT
	JPM	KW	–	07/05/12	ISSUE FOR REVIEW

PROFESSIONAL SEAL (IF REVISION, APPLIES ONLY TO REVISED WORK)
ISSUE (PROGRESS, ESTIMATE, BID, CONSTRUCTION, CONFORMED, REVISION, RECORD)

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UNDULATOR MEASUREMENT FACILITY
COVER SHEET & EQUIPMENT LIST

UNIVERSITY OF CALIFORNIA
LAWRENCE BERKELEY NATIONAL LABORATORY
FACILITIES DIVISION

DRAWN BY JPM	DATE 07/03/2012
CHECKED BY KW	07/03/2012
APPROVED BY KW	07/03/2012
SCALE N/A	
DRAWING NO. 4B77E248	SHEET FA-01
PROJECT NO. FP1110	1 OF 6